

April 30, 2003

TO: G. Burke
FROM: S. Lineaweaver
SUBJECT: Mars Reconnaissance Orbiter Extended Mission

The Resource Allocation Planning and Scheduling Office (RAPSO) performed a loading study to determine the effects of Mars Reconnaissance Orbiter (MRO) extended mission tracking requirements on Deep Space Network (DSN) resources and the ability to support those requests.

Analysis was accomplished using the FASTER (Forecasting And Scheduling Tool for Earth-based Resources) forecasting system, the Mars 6-degree-mask view period, and the updated mission set database from the February 2003 Resource Allocation Review Board (RARB).

MRO has a requirement to carry sufficient consumables to fly the mission until the end of December 2015. Specific relay opportunities during the extended mission are at the present time undefined. MRO provided an estimate of the time needed to support the extended mission Network Relay Phase from January 1, 2011 through December 31, 2015. During the 5-year extended mission 8 hours of DSN tracking time is requested daily on 34-meter antennas. See the attached User Loading Profile for weekly requirement and DSN resource distribution.

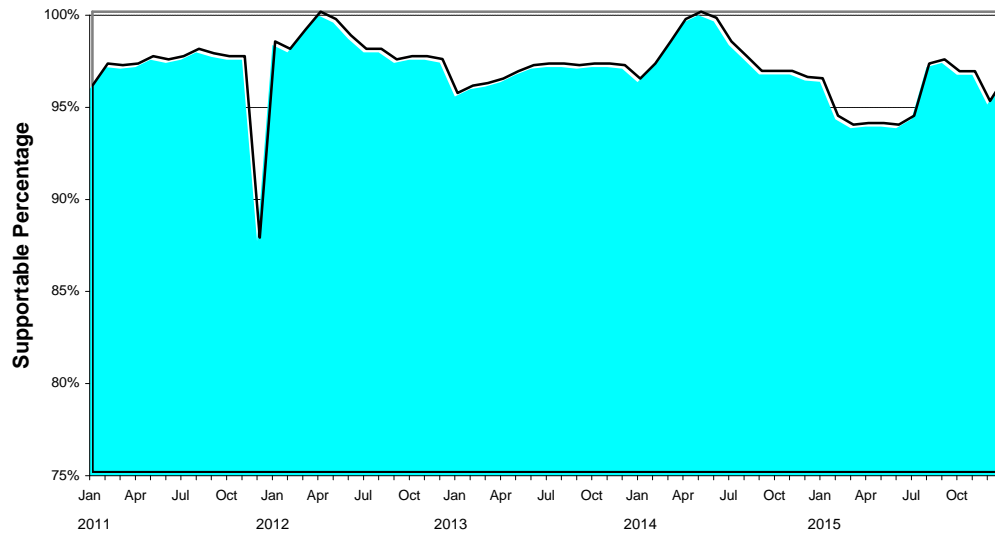
Figure 1 shows the forecast monthly supportable percentage of requested time for the duration of the extended mission requirements. Mars Reconnaissance Orbiter should expect to receive greater than 90% of the time requested except in November of 2011.

In the month of November in 2011 MRO should expect to receive 85 to 90% of the support requested. MRO has contention with a number of other users, as Mars CNES MSR Lander 2011, or alternate 2011 candidate mission to Mars, requires continuous support for their launch and early orbit phase, and M09L, M09T, and MRO each require a daily 8-hour pass supporting their respective surface and relay phases. DSS Maintenance also requires 8 hours of antenna downtime for preventative maintenance at each of the 34-meter antennas. MRO and the other Mars missions have significant view period overlap with the daylight hours requested for preventative maintenance. Contention with the maintenance support is primarily at the Canberra Complex when the two 34-meter antennas are needed daily to support the collective Mars request.

Overall, our preliminary estimates are that Mars Reconnaissance Orbiter can achieve nearly all of the requested support with minimal impact to other users for most of the extended mission. Combined 34-meter support using the multiple spacecraft per antenna

(MSPA) capability between MRO and other missions at Mars or offloading some users' support to the 70-meter Subnet may provide remedy in November 2011 discussed above.

**Figure 1. Mars Reconnaissance Orbiter Extended Mission
Monthly Supportable Percentage of Requested Time**



As always, the results of this study are preliminary in that network loading changes as requirements for planned missions are input and updated. We will continue to work with Mars Reconnaissance Orbiter and other users of the DSN to maximize the time available for each individual user.

cc:

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User Loading Profiles

Concurrence:

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Date _____

Mars Reconnaissance Orbiter

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